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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,421

04/19/2006

Tetsuya Hayashi

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EXAMINER

RADEMAKER, CLAIRE L

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/15/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,421	<b>Applicant(s)</b> HAYASHI ET AL.	
	<b>Examiner</b> CLAIRE L. RADEMAKER	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/9/2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This office action is in response to the amendment filed on April 9, 2008. Claims 1-8 are pending and are rejected for reasons of record.

2. The Examiner notes that this Office Action is Non-Final because Tsukamoto et al. (US 6,022,642) was mistakenly cited in place of Takayama (JP 09-035738) in the Office Action mailed January 9, 2008.

### ***Information Disclosure Statement***

3. The information disclosure statement filed June 18, 2008 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. Specifically, copies of CN 1186357A and the Chinese Office Action, with English Translation, issued in Chinese Patent Application No. CN 2004-80039418 have not been received. Therefore, both CN 1186357A and the aforementioned Chinese Office Action have been crossed out and have not been considered.

Furthermore, the information disclosure statement filed April 19, 2006 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately

from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. Specifically, the International Search Report for PCT/JP2004/018264 was received on April 19, 2006, but was not listed on any information disclosure statements. The April 19, 2006 information disclosure statement has been placed in the application file and all the information referred to therein has been considered.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-5, and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani (US 2003/0180605) in view of Reichert et al. (US 6,217,623) and Takayama (JP 09-035738).

With regard to claims 1 and 3-4, Mizutani et al. teaches a lithium ion secondary battery (paragraphs [0037]-[0038]; Figure 1) including an electrode group that comprises:

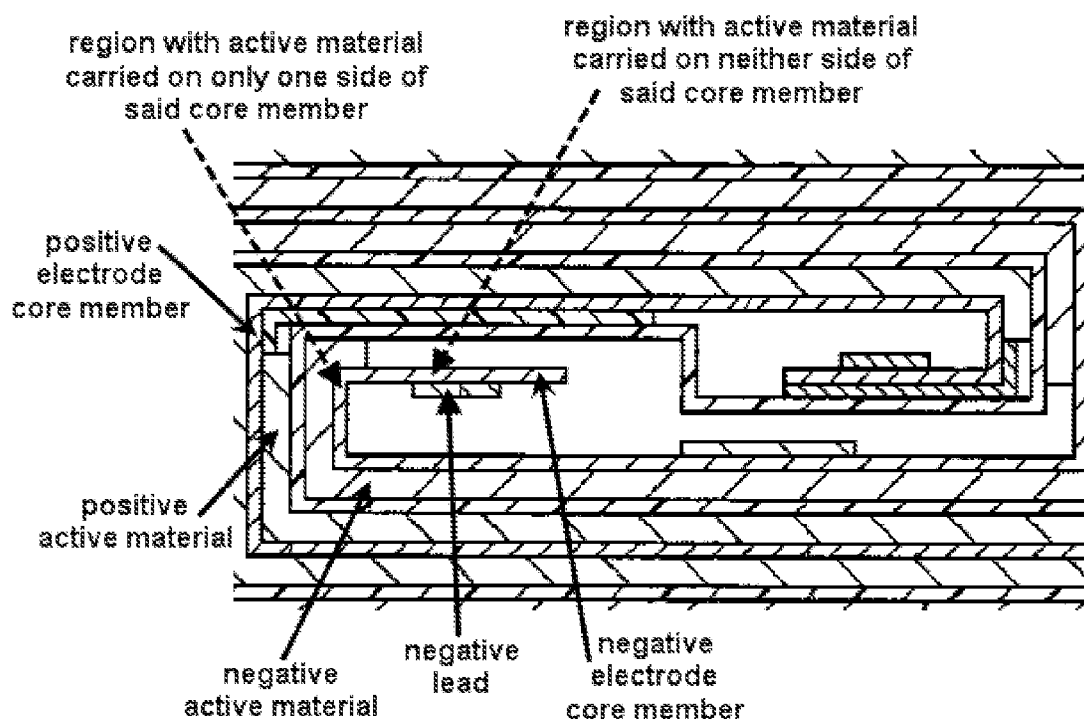
a positive electrode comprising a positive electrode core member (15, paragraph [0044]; Figure 1) and a positive electrode active material layer (2, paragraphs [0038] & [0044]; Figure 1) carried on said positive electrode core member (paragraph [0044]; Figure 1),

a negative electrode comprising a negative electrode core member (16, paragraph [0047]; Figure 1) and a negative electrode active material layer (3, paragraph [0038]; Figure 1) carried on said negative electrode core member (paragraphs [0038] & [0047]; Figure 1),

a porous film (1, paragraphs [0038] & [0050]; Figure 1) disposed between said positive electrode and said negative electrode (paragraph [0038]; Figure 1), wherein said positive electrode and said negative electrode are wound (paragraph [0038]; Figure 1), and wherein said negative electrode has, on the initial winding side, a region where said negative electrode active material layer is carried on neither side of said core member (paragraph [0056]; Figure 1) and an adjoining region where said active material layer is carried on only one side of said core member (paragraph [0038]; Figure 1), and

a lead (9, paragraphs [0038] & [0056]; Figure 1) provided in the region of negative electrode where the active material layer is carried on neither side of said core member (9, paragraphs [0038] & [0056]; Figure 1).

The following illustration (modification of Mizutani Figure 1) is provided for clarification:



Mizutani fails to teach the specified composition of the porous film layer.

Reichert et al. teaches a porous film layer (26, col. 3, lines 23-25 & 34-41 & col. 5, lines 32-39; Figures 1-2) comprising a filler and a binder (col. 5, lines 32-39) in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39), to increase ease of manufacture (col. 5, lines 47-54), and to create a porous film layer than contains a primarily beneficially reactive material that will not form by-products that can cause the cell to self-discharge (col. 5, lines 47-54).

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the porous film layer of Mizutani with the porous film layer of Reichert et al. in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39), to increase ease of manufacture (col. 5,

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lines 47-54), and to create a porous film layer than contains a primarily beneficially reactive material that will not form by-products that can cause the cell to self-discharge (col. 5, lines 47-54).

Modified Mizutani also fails to teach a winding core with a recess at a specified position.

Takayama teaches the concept of a winding core (1, paragraph [0013]; Figures 2), wherein the initial winding side of said winding core has a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode (paragraphs [0016]-[0017]; Figure 2), and said recess corresponds to at least a part of the thickness of said inner electrode (paragraphs [0016]-[0017]; Figure 2) in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the winding core with a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode of Takayama to the lithium ion secondary battery of modified Mizutani et al. in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

With regard to claims 5 and 7-8, Mizutani et al. teaches a method for producing a lithium ion secondary battery (paragraphs [0058]-[0071]) comprising the steps of:

(a) forming a positive electrode active material layer (2, paragraphs [0038] & [0044]; Figures 1 & 4) on both sides of a positive electrode core member (15, paragraph [0044]; Figures 1 & 4) to obtain a positive electrode (paragraph [0044]; Figure 4),

(b) forming a negative electrode active material layer (3, paragraph [0038]; Figures 1 & 5) on both sides of a negative electrode core member (16, paragraph [0047]; Figures 1 & 5) to obtain a negative electrode (paragraph [0047]; Figure 5),

(c) forming a porous film (1, paragraphs [0038] & [0050]; Figure 1) on a surface of said positive electrode and said negative electrode (paragraphs [0066]-[0068] & [0038]; Figures 7A-7D)

(d), winding said positive electrode and said negative electrode with a porous film inbetween said positive and negative electrodes to obtain an electrode group (paragraphs [0068]-[0069]; Figures 7A-7D), and

(e) welding a lead to said region of said positive electrode and said negative electrode where the active material layer is carried on neither side of said core member (paragraphs [0055]-[0056]; Figures 1 & 4-5),

wherein said steps (a) and (b) comprise the step of providing, on the initial winding side of said positive electrode and said negative electrode, a region where said active material layer is carried on neither side of said core member (paragraph [0056]; Figure 1) and an adjoining region where said active layer is carried on only one side of said core member (paragraph [0038]; Figure 1), but fails to teach the specified composition of the porous film layer.



Reichert et al. teaches a porous film layer (26, col. 3, lines 23-25 & 34-41 & col. 5, lines 32-39; Figures 1-2) between an anode and a cathode (col. 2, lines 55-67), where the porous film layer comprises a filler and a binder (col. 5, lines 32-39) in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39), to increase ease of manufacture (col. 5, lines 47-54), and to create a porous film layer than contains a primarily beneficially reactive material that will not form by-products that can cause the cell to self-discharge (col. 5, lines 47-54).

Reichert et al. and Mizutani are considered analogous art because they involve the same field of endeavor: secondary batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the porous film layer of Mizutani with the porous film layer of Reichert et al. in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39), to increase ease of manufacture (col. 5, lines 47-54), and to create a porous film layer than contains a primarily beneficially reactive material that will not form by-products that can cause the cell to self-discharge (col. 5, lines 47-54).

Modified Mizutani also fails to teach the concept of a winding core with a recess at a specified position.

Takayama teaches the concept of a winding core (1, paragraph [0013]; Figures 2), wherein the initial winding side of said winding core has a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode (paragraphs [0016]-[0017]; Figure 2), and said recess corresponds to at least

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a part of the thickness of said inner electrode (paragraphs [0016]-[0017]; Figure 2) in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

Takayama and Mizutani are considered analogous art because they involve the same field of endeavor: secondary batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the winding core with a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode of Takayama to the lithium ion secondary battery of modified Mizutani et al. in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

6. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani (US 2003/0180605), Reichert et al. (US 6,217,623), and Takayama (JP 09-035738), as applied to claims 1 and 5 above, respectively, and further in view of Komatsu et al. (US 2002/0146626).

The disclosure of Mizutani, Reichert et al., and Takayama as discussed above is fully incorporated herein.

With regard to claims 2 and 6, modified Mizutani fails to teach a separator disposed between said positive electrode and said negative electrode, wherein the resulting product is wound.

Komatsu et al. teaches the a separator (31, paragraphs [0039]-[0040]; Figures 3 & 5) disposed between positive (10, paragraph [0040]; Figure 5) and negative (20, paragraph [0040]; Figures 3 & 5) electrodes (paragraphs [0039]-[0040]; Figures 3 & 5) where a porous film (33, 41; paragraphs [[0039]-[0040]; Figures 3 & 5) is also disposed between positive (10, paragraph [0040]; Figure 5) and negative (20, paragraph [0040]; Figures 3 & 5) electrodes (paragraphs [0039]-[0040]; Figures 3 & 5), wherein the resulting product is wound (paragraph [0041]), in order to bond the electrode(s) to the separator, maintain a constant distance between the electrodes, and avoid capacity drop after repeated charges/discharges (paragraph [0045]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the separator of Komatsu et al. to the lithium ion secondary battery of modified Mizutani et al. in order to bond the electrode(s) to the separator, maintain a constant distance between the electrodes, and avoid capacity drop after repeated charges/discharges (paragraph [0045]).

## **Response to Arguments**

### Drawings

7. Applicant's arguments, with regards to the Drawings (specifically Figures 5-6), filed on April 9, 2008, have been fully considered and are persuasive. The objections of Figures 5-6 have been withdrawn due to the Applicant's amendments and arguments.

#### Specification

8. Applicant's arguments with regard to the objections to the Specification regarding Abstract length, filed on April 9, 2008, have been fully considered and the Examiner's objections are withdrawn due to the Applicant's amendments and arguments.

#### Claim Rejections - 35 USC §103

9. Applicant's arguments with respect to claims 1-8, filed on April 9, 2008, have been considered but are not persuasive.

On page 5 of the Applicant's Response, Applicants argue that "there is no valid basis to make the proposed combination [of Mizutani (US 2003/0180605) and Reichert et al. (US 6,217,623)]" (Applicant's Response, page 5).

In response to applicant's argument that there is no suggestion to combine the references Mizutani and Reichert et al. (Applicant's Response, page 5), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves

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or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Reichert et al. teaches that it is advantageous for a secondary battery to contain a porous film layer (26, col. 3, lines 23-25 & 34-41 & col. 5, lines 32-39; Figures 1-2) between an anode and a cathode (col. 2, lines 55-67), where the porous film layer comprises a filler and a binder (col. 5, lines 32-39), in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39), to increase ease of manufacture (col. 5, lines 47-54), and to create a porous film layer than contains a primarily beneficially reactive material that will not form by-products that can cause the cell to self-discharge (col. 5, lines 47-54).

On pages 5-6 of the Applicant's Response, Applicants argue that "if the porous film of Reichert, which has a positive and negative electrode on both sides of the separator, were used in the wound battery of Mizutani, the battery of Mizutani would be rendered inoperable for its stated purpose of eliminating a component that does not contribute to power generation" (Applicant's Response, pages 5-6).

The Examiner respectfully disagrees with the Applicants argument that "if the porous film of Reichert, which has a positive and negative electrode on both sides of the separator, were used in the wound battery of Mizutani, the battery of Mizutani would be rendered inoperable for its stated purpose of eliminating a component that does not contribute to power generation" (Applicant's Response, pages 5-6) because Mizutani

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clearly states that the component which is being eliminated in order to improve energy density is the active material layer on the outermost periphery of the wound electrode because it has substantially no contribution to the electromotive as a battery (paragraphs [0015], [0056], & [0080]).

On page 6 of the Applicant's Response, Applicants argue that Tsukamoto et al. (US 6,022,642) fails to teach "a winding core having a recess where it comes into contact with the inner electrode" (Applicant's Response, page 6).

In response to the Applicant's Argument that Tsukamoto et al. fails to teach "a winding core having a recess where it comes into contact with the inner electrode" (Applicant's Response, page 6), the Examiner notes that Tsukamoto et al. (US 6,022,642) was mistakenly cited in place of Takayama (JP 09-035738) in the Office Action mailed January 9, 2008. All arguments regarding Tsukamoto et al. are directed to Takayama et al.

### ***Conclusion***

10. The prior art made of record and not relied upon which is considered pertinent to applicant's disclosure is as follows: Mizokawa et al. (JP 2004-063343) discloses a rechargeable lithium ion battery comprising a positive electrode, a negative electrode, and a separator inbetween said positive and negative electrodes, where said positive and negative electrodes and said separator are wound, and where said positive

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electrode has on the initial winding side, a region where said active material layer is carried on neither side of said core member and has an adjoining region where said active material layer is carried on only one side of said core member; and Kato et al. (US 2004/0121232) discloses battery comprising a positive electrode, a negative electrode, and a separator inbetween said positive and negative electrodes, where said positive and negative electrodes and said separator are wound, and where said positive electrode has on the initial winding side, a region where said active material layer is carried on neither side of said core member and has an adjoining region where said active material layer is carried on only one side of said core member.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE L. RADEMAKER whose telephone number is (571)272-9809. The examiner can normally be reached on Monday - Friday, 8:00AM - 4:30PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. L. R./  
Examiner, Art Unit 1795

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795